Claims

1. A nucleic acid sequence coding for the Japanese cedar pollen *Cry j* I.

2. The nucleic acid sequence of Claim 1 wherein said nucleic acid sequence has the nucleotide sequence of bases 66 through 1187 of SEQ ID NO: 1.

3. The nucleic acid sequence of claim 1 wherein said nucleic acid sequence has the nucleotide sequence of bases 129 through 1187 of SEQ ID NO: 1.

4. A nucleic acid sequence coding for at least one fragment of *Cry j* I thereof.

5. A nucleic acid sequence of claim 1 wherein said nucleic acid sequence consists essentially of at least one fragment of the coding portion of the nucleic acid sequence of *Cry j* I as shown in Fig. 4a-b (SEQ ID NO: 1).

6. A host cell transformed to express a peptide encoded by the nucleic acid sequence of claim 1.

7. An expression vector comprising a nucleic acid sequence coding for the Japanese cedar pollen allergen *Cry j* I, or at least one antigenic fragment thereof.

8. The expression vector of claim 5 wherein said nucleic acid sequence has the nucleotide sequence of bases 66 through 1187 of SEQ ID NO: 1.

9. The expression vector of claim 7 wherein said nucleic acid sequence has the nucleotide sequence of bases 129 through 1187 of SEQ ID NO: 1.

10. A host cell transformed to express a protein or peptide encoded by the nucleic acid sequence of claim 2.

11. A host cell transformed to express a protein or peptide encoded by the nucleic acid sequence of claim 3.

12. A host cell of claim 6 wherein said host cell is *E.coli.*

13. Purified Japanese cedar pollen allergen *Cry j* I or at least one antigenic fragment thereof produced in a host cell transformed with the nucleic acid sequence of claim 3.

14. An isolated nucleic acid having a nucleotide sequence coding for *Jun s* I, or at least one fragment thereof.

15. An isolated nucleic acid sequence of claim 14 wherein said nucleotide sequence consists essentially of the coding portion of the nucleotide sequence of Fig. 16 (SEQ ID NO: 94).

16. An isolated nucleic acid sequence of claim 14 wherein said nucleotide sequence consists essentially of the nucleotide sequence of Fig. 16 (SEQ ID NO: 94).

17. An expression vector comprising a nucleotide sequence coding for *Jun s* I, or at least one fragment thereof.

18. An expression vector of claim 17 wherein said nucleotide sequence consists essentially of the coding portion of the nucleotide sequence of Fig. 16 (SEQ ID NO: 94).

19. A host cell transformed to express a protein or peptide encoded by the nucleic acid of claim 14.

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20. Isolated *Jun s* I protein, or at least one antigenic fragment thereof, produced in a host cell transformed with the nucleic acid of claim 14.

21. An isolated nucleic acid having a nucleotide sequence coding for *Jun v* I, or at least one fragment thereof.

22. An isolated nucleic acid sequence of claim 21 wherein said nucleotide sequence consists essentially of the coding portion of the nucleotide sequence of Fig. 17 (SEQ ID NO: 96).

23. An isolated nucleic acid sequence of claim 21 wherein said nucleotide sequence consists essentially of the nucleotide sequence of Fig. 17 (SEQ ID NO: 96).

24. An expression vector of claim 24 wherein said nucleotide sequence consists essentially of the coding portion of the nucleotide sequence of Fig. 17 (SEQ ID NO: 96).

25. An expression vector of claim 24 wherein said nucleotide sequence consists essentially of the coding portion of the nucleotide sequence of Fig. 17 (SEQ ID NO: 96).

26. A host cell transformed to express a protein or peptide encoded by the nucleic acid of claim 21.

27. Isolated *Jun v* I protein, or at least one antigenic fragment thereof, produced in a host cell transformed with the nucleic acid of claim 21.

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28. A method of producing *Jun s* I or at least one fragment thereof comprising the steps of:

a) culturing a host cell transformed with a nucleic acid sequence encoding *Jun s* I or fragment thereof in a appropriate medium to produce a mixture of cells and medium containing said *Jun s* I or at least one fragment thereof; and

b) purifying said mixture to produce substantially pure *Jun s* I, or at least one fragment thereof.

29. A method of producing *Jun v* I or at least one fragment thereof comprising the

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steps of:

a) culturing a host cell transformed with a nucleic acid sequence encoding *Jun v* I or fragment thereof in an appropriate medium to produce a mixture of cells and medium containing said *Jun v* I or at least one fragment thereof; and

b) purifying said mixture to produce substantially pure *Jun v* I, at least one fragment thereof.

30. A nucleic acid having a nucleotide sequence coding for a Japanese Cedar pollen allergen *Cry j* II, or at least one antigenic fragment thereof.

31. A nucleic acid of claim 30 wherein said nucleotide sequence consists essentially of at least one fragment of the coding portion of the nucleotide sequence of Fig. 28 (SEQ ID NO: 133).

32. A nucleic acid of claim 31 wherein said fragment comprises bases 108 through 1586 of the nucleotide sequence of Fig. 28 (SEQ ID NO: 133).

33. A nucleic acid of claim 30 wherein said nucleotide sequence consists essentially of the nucleotide sequence of Fig. 28 (SEQ ID NO: 133).

34. A nucleic acid of claim 36 wherein said fragment comprises a nucleic acid sequence from the group consisting of bases 177 through 1586 of the nucleotide sequence of Fig. 28 (SEQ ID NO: 133) and bases 192 through 1586 of the nucleotide sequence of Fig. 28 (SEQ ID NO: 133).

35. An expression vector comprising a nucleotide sequence coding for a Japanese cedar pollen allergen *Cry j* II, or at least one antigenic fragment thereof.

36. An expression vector of claim 35 wherein said nucleotide sequence consists essentially of at least one fragment of the coding portion of the nucleotide sequence of Fig. 28 (SEQ ID NO: 133).

37. An expression vector of claim 35 wherein said nucleotide sequence comprises bases 108 through 1586 of the nucleotide sequence of Fig. 28 (SEQ ID NO: 133).

38. A host cell transformed to express a protein or peptide encoded by the nucleic acid of claim 30.

39. Isolated *Cry j* II protein, or at least one antigenic fragment thereof, produced in a host cell transformed with the nucleic acid of claim 30.

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40. A method of producing *Cry j* II protein, or at least one antigenic fragment thereof, comprising the steps of:

a) culturing a host cell transformed with a DNA sequence encoding *Cry j* II protein or fragment thereof, in an appropriate medium to produce a mixture of cells and medium containing *Cry j* II protein or at least one fragment thereof; and

b) purifying said mixture to produce substantially pure *Cry j* II protein, or at least one fragment thereof.

41. Purified Japanese cedar pollen allergen of claim 13 wherein said Japanese cedar pollen allergen binds immunoglobulin E to a substantially lesser extent than purified native Japanese cedar pollen allergen binds said immunoglobulin E.

42. An isolated specific antigenic fragment of *Cry j* I.

43. An isolated specific antigenic fragment of claim 42 wherein said specific fragment is produced by recombinant DNA techniques, chemical synthesis, or chemical cleavage of the native protein.

44. The antigenic fragment of claim 42 wherein said antigenic fragment comprises at least one T cell epitope.

45. The specific antigenic fragment of claim 44 wherein said antigenic fragment has minimal immunoglobulin E stimulating activity.

46. The specific antigenic fragment of claim 44 wherein said antigenic fragment does not bind immunoglobulin E.

47. Purified *Cry j* I protein or specific antigenic fragment thereof wherein said purified protein or said specific antigenic fragment is capable of modifying, in a Japanese cedar pollen-sensitive individual to which it is administered, the allergic response to Japanese cedar pollen.

48. The purified protein or specific antigenic fragment of claim 47 wherein said

purified protein or said antigenic fragment is capable of modifying B-cell response of the individual to a Japanese cedar pollen allergen, T-cell response of the individual to a Japanese cedar pollen antigen, or both the B-cell response and the T-cell response of the individual to Japanese cedar pollen allergen.

49. An isolated protein allergen or specific antigenic fragment thereof of *Cry j* I wherein said isolated protein allergen or specific antigenic fragment thereof is capable of stimulating T cell specific for *Cry j* I or a fragment thereof.

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50. A therapeutic composition comprising an isolated Japanese cedar pollen allergen *Cry j* I peptide or at least one specific antigenic fragment thereof and a pharmaceutically acceptable carrier or diluent.

51. A method of treating sensitivity to Japanese cedar pollen allergen or an allergen immunologically cross-reactive with Japanese cedar pollen allergen in a mammal sensitive to said allergen, comprising administering to said mammal a therapeutically effective amount of at least one therapeutic composition of claim 50.

52. A method of detecting sensitivity in a mammal to a Japanese cedar pollen allergen comprising combining a blood sample obtained from said mammal with a purified Japanese cedar pollen allergen or antigenic fragment thereof produced in a host cell transformed with the nucleic acid sequence of claim 1 or chemically synthesized under conditions appropriate for binding of blood components with the protein or fragment thereof and determining the extent to which such binding occurs.

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53. A monoclonal antibody specifically reactive with a Japanese cedar pollen allergen, *Cry j* I, or at least one antigenic fragment thereof.

54. All or a portion of an isolated peptide of *Cry j* I, said peptide or portion thereof comprising at least one T cell epitope of *Cry j* I said peptide having an amino acid sequence selected from the group consisting of amino acid residues 1-40, amino acid residues 81-110, amino acid residues 151-180, amino acid residues 191-240, and amino acid residues 291-330 of *Cry j* I as shown in Fig. 4a-b (SEQ ID NO: 2).

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55. A method of designing antigenic fragments of *Cry j* I which when administered to Japanese cedar pollen sensitive individuals in sufficient quantity will modify the individual's allergic exposure to Japanese cedar pollen comprising the steps of:

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a) producing peptides of *Cry j* I by recombinant techniques, chemical synthesis, or chemical cleavage of the native protein;

b) examining said peptides for their ability to influence B cell and/or T cell responses in Japanese cedar pollen sensitive individuals; and

c) selecting appropriate peptides which contain epitopes recognized by the cells.

56. An isolated peptide of *Cry j* I or an isolated portion thereof, said peptide or portion thereof comprising at least one T cell epitope of *Cry j* I, said peptide having an amino acid sequence selected from the group consisting of CJ1-2 (SEQ ID NO: 27), CJ1-3 (SEQ ID NO: 28), CJ1-4 (SEQ ID NO: 29), CJ1-7 (SEQ ID NO: 32), CJ1-8 (SEQ ID NO: 33), CJ1-9 (SEQ ID NO: 34), CJ1-10 (SEQ ID NO: 35), CJ1-11 (SEQ ID NO: 36), CJ1-12 (SEQ ID NO: 37), CJ1-14 (SEQ ID NO: 39), CJ1-15 (SEQ ID NO: 40), CJ1-16 (SEQ ID NO: 41), CJ1-17 (SEQ ID NO: 42), CJ1-18 (SEQ ID NO: 43), CJ1-19 (SEQ ID NO: 44), CJ1-20 (SEQ ID NO: 45), CJ1-21 (SEQ ID NO: 46), CJ1-22 (SEQ ID NO: 47), CJ1-23 (SEQ ID NO: 48), CJ1-24 (SEQ ID NO: 49), CJ1-25 (SEQ ID NO: 50), CJ1-26 (SEQ ID NO: 51), CJ1-27 (SEQ ID NO: 52), CJ1-30 (SEQ ID NO: 55), CJ1-31 (SEQ ID NO: 56), CJ1-32 (SEQ ID NO: 57), and CJ1-35 (SEQ ID NO: 60), CJI-42.5, (SEQ ID NO: 119) CJI-42.8 (SEQ ID NO: 120), CJI-43.26 (SEQ ID NO: 121), CJI-43.27 (SEQ ID NO: 122), CJI-43.30 (SEQ ID NO: 123), CJI-43.31 (SEQ ID NO: 124), CJI-43.32 (SEQ ID NO: 125), CJI-43.35 (SEQ ID NO: 126), CJI-43.36 (SEQ ID NO: 127), CJI-43.39 (SEQ ID NO: 128), CJI-24.5 (SEQ ID NO: 129), CJI-44.5 (SEQ ID NO: 130), CJI-44.6 (SEQ ID NO: 131), CJI-44.8 (SEQ ID NO: 132) .

57. An isolated peptide or portion thereof of claim 56 wherein said portion of said peptide has a mean T cell stimulation index equivalent to or greater than the mean T cell stimulation index of said peptide as shown in Fig. 14 or Fig. 21.

58. An isolated peptide or portion thereof of claim 56 which comprises at least two T cell epitopes.

59. An isolated peptide or portion thereof of claim 56 which, when administered to an individual sensitive to Japanese cedar pollen, reduces T cell responsiveness in the individual or modifies the lymphokine secretion profile of T cells in the individual.

60. All or a portion of an isolated peptide of claim 56 which modifies in an individual sensitive to Japanese cedar pollen to whom it is administered, the allergic

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response of the individual to a Japanese cedar pollen.

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61. An isolated nucleic acid sequence having a sequence encoding all or a portion of a peptide of claim 56, or the functional equivalent of said nucleic acid sequence.

62. A modified peptide or a modified portion of a peptide of claim 56.

63. A modified peptide or a modified portion of a peptide of claim 62 which does not bind immunoglobulin E specific for *Cry j* I in a substantial percentage of individuals sensitive to *Cry j* I, or if binding of the peptide or portion thereof to said immunoglobulin E occurs, such binding does not result in release of mediators from mast cells or basophils in a substantial percentage of individuals sensitive to *Cry j* I.

64. A modified peptide or a modified portion of a peptide of claim 62 which modifies, in an individual sensitive to Japanese cedar pollen to whom it is administered, the allergic response of the individual to a Japanese cedar pollen allergen.

65. An isolated peptide comprising at least two regions, each region comprising at least one T cell epitope of *Cry j* I, said regions each comprising all or a portion of an amino acid sequence selected from the group consisting of: CJ1-1 (SEQ ID NO: 26), CJ1-2 (SEQ ID NO: 27), CJ1-3 (SEQ ID NO: 28), CJ1-4 (SEQ ID NO: 29), CJ1-7 (SEQ ID NO: 32), CJ1-8 (SEQ ID NO: 33), CJ1-9 (SEQ ID NO: 34), CJ1-10 (SEQ ID NO: 35), CJ1-11 (SEQ ID NO: 36), CJ1-12 (SEQ ID NO: 37), CJ1-14 (SEQ ID NO: 39), CJ1-15 (SEQ ID NO: 40), CJ1-16 (SEQ ID NO: 41), CJ1-17 (SEQ ID NO: 42), CJ1-18 (SEQ ID NO: 43), CJ1-19 (SEQ ID NO: 44), CJ1-20 (SEQ ID NO: 45), CJ1-21 (SEQ ID NO: 46), CJ1-22 (SEQ ID NO: 47), CJ1-23 (SEQ ID NO: 48), CJ1-24 (SEQ ID NO: 49), CJ1-25 (SEQ ID NO: 50), CJ1-26 (SEQ ID NO: 51), CJ1-27 (SEQ ID NO: 52), CJ1-28 (SEQ ID NO: 53), CJ1-30 (SEQ ID NO: 55), CJ1-31 (SEQ ID NO: 56), CJ1-32 (SEQ ID NO: 57), CJ1-33 (SEQ ID NO: 58), CJ1-34 (SEQ ID NO: 59) and CJ1-35 (SEQ ID NO: 60) CJ1-2 (SEQ ID NO: 27), CJ1-9 (SEQ ID NO: 34), CJ1-10 (SEQ ID NO: 35), CJ1-16 (SEQ ID NO: 41), CJ1-17 (SEQ ID NO: 42), CJ1-20 (SEQ ID NO: 45), CJ1-22 (SEQ ID NO: 47), CJ1-23 (SEQ ID NO: 48), CJ1-24 (SEQ ID NO: 49), CJ1-25 (SEQ ID NO: 50), CJ1-26 (SEQ ID NO: 51), CJ1-27 (SEQ ID NO: 52), CJ1-30 (SEQ ID NO: 55), CJ1-31 (SEQ ID NO: 56), CJ1-32 (SEQ ID NO: 57), CJ1-35 (SEQ ID NO: 60), CJI-42.5 (SEQ ID NO: 119), CJI-42.8 (SEQ ID NO: 120), CJI-43.26 (SEQ ID NO: 121), CJI-43.27 (SEQ ID NO: 122), CJI-43.30 (SEQ ID NO: 123), CJI-43.31 (SEQ ID NO: 124), CJI-43.32 (SEQ ID NO: 125), CJI-43.35 (SEQ ID NO: 126),

CJI-43.36 (SEQ ID NO: 127), CJI-43.39 (SEQ ID NO: 128), CJI-24.5 (SEQ ID NO: 129), CJI-44.5 (SEQ ID NO: 130), CJI-44.6 (SEQ ID NO: 131), CJI-44.8 (SEQ ID NO: 132) all as shown in Fig. 20.

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66. A therapeutic composition comprising at least one isolated peptide or a portion thereof of claim 56 and a pharmaceutically acceptable carrier or diluent.

67. A method of treating sensitivity to Japanese cedar pollen allergen or an allergen which is immunologically cross-reactive with Japanese cedar pollen allergen in an individual, comprising administering to the individual a therapeutically effective amount of the composition of claim 66.

68. A method of treating sensitivity to Japanese cedar pollen allergen or an allergen which is immunologically cross-reactive with Japanese cedar pollen allergen in an individual, comprising administering simultaneously or sequentially to the individual a therapeutically effective amount of at least two different compositions of claim 66.

69. A composition of claim 50 wherein said peptides are selected from the group consisting of: CJI-42.5 (SEQ ID NO: 119), CJI-42.8 (SEQ ID NO: 120), CJI-43.26 (SEQ ID NO: 121), CJI-43.27 (SEQ ID NO: 122), CJI-43.30 (SEQ ID NO: 123), CJI-43.31 (SEQ ID NO: 124), CJI-43.32 (SEQ ID NO: 125), CJI-43.35 (SEQ ID NO: 126), CJI-43.36 (SEQ ID NO: 127), CJI-43.39 (SEQ ID NO: 128), CJI-24.5 (SEQ ID NO: 129), CJI-44.5 (SEQ ID NO: 130), CJI-44.6 (SEQ ID NO: 131), CJI-44.8 (SEQ ID NO: 132) all as shown in Fig. 20; and wherein said composition comprises a sufficient percentage of the T cell epitopes of said protein allergen such that upon administration of the composition to an individual sensitive to *Cry j* I, T cells of the individual are rendered unresponsive to said at least one protein allergen.

70. An isolated protein allergen or antigenic fragment thereof that is immunologically related to *Cry j* I or fragment thereof.

71. An isolated protein allergen of claim 70 wherein said protein allergen is *Jun s* I or *Jun v* I.

72. An isolated purified native protein or peptide of *Jun v* I.

73. Isolated *Jun s* I or at least one antigenic fragment thereof.

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74. A therapeutic composition comprising isolated *Jun s* I pollen allergen or at least one fragment thereof and a pharmaceutically acceptable carrier or diluent.

75. A method of treating sensitivity to pollen allergen from the *Juniperus* species in a mammal sensitive to said pollen comprising administering a therapeutically effective amount of at least one therapeutic composition of claim 74.

76. A method of detecting sensitivity in a mammal to *Jun s* I, comprising combining a blood sample obtained from said mammal with a purified *Jun s* I allergen or antigenic fragment thereof produced in a host cell transformed with the nucleic acid sequence of claim 14 or chemically synthesized to provoke an allergic response in said mammal and determining the occurrence of an allergic response in the individual to said *Jun s* I allergen or antigenic fragment thereof.

77. Isolated *Jun v* I or at least one antigenic fragment thereof.

78. A therapeutic composition comprising isolated *Jun v* I pollen allergen or at least one fragment thereof and a pharmaceutically acceptable carrier or diluent.

79. A method of treating sensitivity to pollen allergen from the Juniperus species in a mammal sensitive to said pollen comprising administering a therapeutically effective amount of at least one composition of claim 74.

80. A method of detecting sensitivity in a mammal to *Jun v* I, comprising combining a blood sample obtained from said mammal with a purified *Jun v* I allergen or antigenic fragment thereof produced in a host cell transformed with the nucleic acid sequence of claim 21 or chemically synthesized to provoke an allergic response in said mammal and determining the occurrence of an allergic response in the individual to said *Jun v* I allergen or antigenic fragment thereof.

81. A protein preparation comprising *Cry j* II protein, or at least one specific antigenic fragment thereof, synthesized in a host cell transformed with a nucleic acid comprising a nucleotide sequence encoding all or a portion of *Cry j* II.

82. A protein preparation comprising *Cry j* II protein or at least one specific antigenic fragment thereof.

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83. A protein preparation of claim 81 wherein said *Cry j* II protein comprises an amino acid sequence shown in Fig. 28 (SEQ ID NO: 134).

84. A protein preparation of claim 82 wherein said *Cry j* II protein comprises an amino acid sequence shown in Fig. 28 (SEQ ID NO: 134).

85. An isolated specific antigenic fragment of *Cry j* II.

86. An isolated specific antigenic fragment of claim 85 which as minimal immunoglobulin E stimulating activity.

87. An isolated specific antigenic fragment of claim 85 which binds immunoglobulin E to a substantially lesser extent than purified native *Cry j* II protein binds said immunoglobulin E.

88. Isolated *Cry j* II peptide, or an isolated specific antigenic fragment thereof, which modifies, in an individual sensitive to Japanese cedar pollen to whom it is administered, the allergic response of the individual to a Japanese cedar pollen allergen.

89. Isolated *Cry j* II peptide or isolated specific antigenic fragment of claim 88 which modifies B cell response of the individual to a Japanese cedar pollen allergen, T cell response of the individual to a Japanese cedar pollen allergen, or both the B cell response and the T cell response of the individual to a Japanese cedar pollen allergen.

90. Modified *Cry j* II peptide or at least one modified antigenic fragment thereof, which when administered to an individual sensitive to Japanese cedar pollen, reduces the allergic response of the individual to *Cry j* II.

91. A therapeutic composition comprising isolated *Cry j* II peptide, or at least one isolated specific antigenic fragment thereof, and a pharmaceutically acceptable carrier or diluent.

92. A method of treating sensitivity to a Japanese cedar pollen allergen, or an allergen immunologically cross-reactive with a Japanese cedar pollen allergen, in an individual sensitive to said allergen, comprising administering to the individual a therapeutically effective amount of the composition of claim 91.

93. A method of detecting sensitivity in an individual to a Japanese cedar pollen allergen, comprising combining a blood sample obtained from the individual with isolated *Cry j* II protein, or antigenic fragment thereof, produced in a host cell transformed with the nucleic acid of claim 30 or chemically synthesized, under conditions appropriate for binding of blood components with the protein or fragment thereof, and determining the extent to which such binding occurs.

94. A monoclonal antibody, polyclonal antibody or immunoreactive fragment thereof, specifically reactive with *Cry j* II protein, or at least one antigenic fragment thereof.

95. A host call transformed with a vector containing the cDNA insert of *Cry j* II, said host cell having ATCC deposit number 69105.

96. An isolated peptide of *Cry j* II or an isolated portion thereof comprising at least one T cell epitope of *Cry j* II, said peptide having the amino acid sequence selected from the group consisting of Cry j IIC (SEQ ID NO:187), Cry j IID (SEQ ID NO: 188), Cry j IIE (SEQ ID NO 189), Cry j IIF (SEQ ID NO: 190), Cry j IIG, (SEQ ID NO: 191) and Cry j IIH (SEQ ID NO: 192) as shown in Fig. 41.

97. An isolated peptide or protein thereof of claim 96 wherein said portion of said peptide has a mean T cell stimulation index equivalent to or greater than the mean T cell stimulation index of said peptide as shown in Fig. 42.

98. A therapeutic composition comprising at least one isolated peptide or a portion thereof of claim 96 and a pharmaceutically acceptable carrier or diluent.

99. A method of treating sensitivity to a Japanese cedar pollen allergen in an individual sensitive to said allergen comprising administering to the individual a therapeutically effective amount of the composition of claim 98.

100. A therapeutic composition comprising at least one isolated peptide of *Cry j* I and at least one isolated peptide of *Cry j* II and a pharmaceutically acceptable carrier or diluent.

101. A method of treating sensitivity to Japanese Cedar Pollen in an individual

sensitive to said pollen comprising administering to said individual a therapeutically effective amount of the composition of claim 99.

102. A therapeutic composition of claim 66 comprising at least one peptide selected from the group consisting of CJI-42.5 (SEQ ID NO: 119), CJI-43.39 (SEQ ID NO: 128), CJI-24.5 (SEQ ID NO: 129) and CJI-44.8 (SEQ ID NO: 132).

103. A method of treating sensitivity to Japanese Cedar Pollen allergen or an allergen immunologically cross-reactive with Japanese Cedar Pollen allergen comprising administering sequentially or simultaneously, at least two different compositions of claim 102.

104. A method of treating sensitivity to Japanese Cedar Pollen allergen or an allergen immunologically cross-reactive with Japanese Cedar Pollen allergen comprising administering sequentially or simultaneously the following peptides: CJI-42.5 (SEQ ID NO: 119), CJI-43.39 (SEQ ID NO: 128), CJI-24.5 (SEQ ID NO: 129) and CJI-44.8 (SEQ ID NO: 132).

105. A method of treating sensitivity to Japanese Cedar Pollen allergen or an allergen immunologically cross-reactive with Japanese Cedar Pollen allergen comprising administering sequentially or simultaneously at least one peptide of *Cry j* II in combination with at least two different compositions of claim 102.

106. Purified native *Cry j* I protein allergen.

107. The purified native *Cry j* I protein allergen of claim 106 wherein the purity of said protein is greater than 99%.

108. Purified native *Cry j* II protein allergen.

109. The purified native *Cry j* II protein allergen of claim 108 wherein said protein is purified to homogeneity.

110. A modified peptide of *Cry j* I, wherein said peptide has been modified to enhance solubility.

111. A modified peptide of claim 110 wherein said peptide has been modified by the

addition of at least one charged amino acid to the carboxy terminus of the peptide, to the amino terminus of the peptide, or to both the carboxy and amino terminii of the peptide.

112. A modified peptide of claim 11 wherein said peptide is selected from the group consisting of: CJI-42.5 (SEQ ID NO: 119), CJI-42.8 (SEQ ID NO: 120), CJI-43.26 (SEQ ID NO: 121), CJI-43.27 (SEQ ID NO: 122), CJI-43.30 (SEQ ID NO: 123), CJI-43.31 (SEQ ID NO: 124), CJI-43.32 (SEQ ID NO: 125), CJI-43.35 (SEQ ID NO: 126), CJI-43.36 (SEQ ID NO: 127), CJI-43.39 (SEQ ID NO: 128), CJI-24.5 (SEQ ID NO: 129), CJI-44.5 (SEQ ID NO: 130), CJI-44.6 (SEQ ID NO: 131), CJI-44.8 (SEQ ID NO: 132) all as shown in Fig. 20

113. A modified peptide of *Cry j* II, wherein said peptide has been modified to enhance solubility.

114. A therapeutic composition comprising at least one peptide derived from *Cry j* I and at least one peptide derived from *Cry j* II.

115. A therapeutic composition of claim 114 comprising at least one peptide selected from the group consisting of CJI-42.5 (SEQ ID NO: 119), CJI-42.8 (SEQ ID NO: 120), CJI-43.26 (SEQ ID NO: 121), CJI-43.27 (SEQ ID NO: 122), CJI-43.30 (SEQ ID NO: 123), CJI-43.31 (SEQ ID NO: 124), CJI-43.32 (SEQ ID NO: 125), CJI-43.35 (SEQ ID NO: 126), CJI-43.36 (SEQ ID NO: 127), CJI-43.39 (SEQ ID NO: 128), CJI-24.5 (SEQ ID NO: 129), CJI-44.5 (SEQ ID NO: 130), CJI-44.6 (SEQ ID NO: 131), CJI-44.8 (SEQ ID NO: 132) all as shown in Fig. 20, and at least one peptide derived from *Cry j* II.

116. A method of treating sensitivity to Japanese cedar pollen allergen or an allergen which is immunologically cross reactive with Japanese cedar pollen allergen, in an individual comprising administering to the individual a therapeutically effective amount of a composition of of claim 114.

117. A method of treating sensitivity to Japanese cedar pollen allergen or an allergen which is immunologically cross reactive with Japanese cedar pollen allergen, in an individual, comprising administering simultaneously or sequentially to the individual a therapeutically effective amount of at least one therapeutic composition comprising at least one peptide derived from *Cry j* I and at least one therapeutic composition comprising at least one peptide derived from *Cry j* II.

118. An isolated specific fragment of claim 42 wherein said fragment binds IgE.

119. A method of detecting sensitivity in a mammal comprising administering an Immediate Type Hypersensivity test using at least one fragment of claim 18.

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120. An isolated specific fragment of claim 85 wherein said fragment binds IgE.

121. A method of detecting sensitivity in a mammal comprising administering an Immediate Type Hypersensitivity test using at least one fragment of claim 120.